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More Temperate Zone Plants for Interiorscapes

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Researchers at Auburn University continue to investigate the potential for using Temperate Zone plants for interior landscaping. George Pinyuh reported on their earlier work in the autumn 1987 issue of *Interior Hort.* Since then they have evaluated more species and cultivars, and they have studied the effect of production light levels on the subsequent indoor performance of Temperate Zone plants.

In this study, Temperate Zone plants were grown outdoors for approximately five months. The plants of each species were divided into three groups which were grown under one of the following light conditions: full sun, 47% shade, or 64% shade. The plants were then moved indoors for 15 weeks. The interior environment was characterized by a 12-hour photoperiod provided by cool white fluorescent lights, a temperature of 21.1°C (70°F), and 80% relative humidity. After 15 weeks indoors, the plants were given quality ratings (1 = poor, not saleable; 3 = good, saleable; 5 = excellent) based upon growth habit, leaf size and spacing, foliage color, leaf drop, and overall appearance.

Except for *Buxus*, all the plants grown in 64% shade were rated as good to excellent. Generally, shade-grown plants were of higher quality than those grown in full sun, but *Magnolia grandiflora*, *Nandina domestica*, *Ophiopogon japonicus*, and *Ternstroemia gymnanthera* were rated consistently high at all three production light levels. While *Raphiolepis* was of acceptable quality when grown in 47% and 64% shade, all specimens grown in full sun died in the interior environment. *Buxus* was the only plant to be rated unacceptable at all three production light levels.

In addition to production light levels, the researchers were interested in how Temperate Zone plants would react to the lack of winter dormancy. After 15 weeks indoors, the test plants were moved to a greenhouse for another five months. The greenhouse was kept at 21.1°C (70°F). Without exposure to normal winter temperatures, all the plants except for the *Buxus* produced new growth, indicating that dormancy was not a limiting factor.

While *Buxus* does not appear to adapt itself to indoor conditions, all the other species and cultivars listed below may prove useful for interiorscapes.

Species/ Production Light Level	Quality*
Ajuga reptans	
full sun	1.6
47% shade	1.9
64% shade	3.0
Aucuba japonica 'Variegata Nana'	
full sun	1.6
47% shade	4.8
64% shade	4.8
Buxus microphylla var. koreana 'Wintergreen'	
full sun	0.0
47% shade	2.6
64% shade	2.8
Euonymous fortunei 'Variegata'	
full sun	1.0
47% shade	2.8
64% shade	4.0
Euonymous japonica 'Aureo-marginata'	
full sun	1.8
47% shade	3.8
64% shade	5.0
Ficus pumila	
full sun	3.5
47% shade	4.1
64% shade	4.6
Hosta ventricosa	
full sun	2.0
47% shade	3.8
64% shade	3.9
Illicium parviflorum	
full sun	2.6
47% shade	3.7
64% shade	4.1
Ligustrum japonicum 'Variegatum'	
full sun	3.6
46% shade	4.7
64% shade	4.8
Liriope spicata	
full sun	3.7
47% shade	4.8
64% shade	4.8
Magnolia grandiflora	
full sun	4.6
47% shade	4.8
64% shade	4.8
Mahonia aquifolium 'King's Ransom'	
full sun	1.1
47% shade	3.2
64% shade	3.4
Nandina domestica 'Wood's Dwarf'	
full sun	1.9
47% shade	4.2
64% shade	4.6
Nandina domestica	
full sun	4.2
47% shade	4.6
64% shade	4.8
Ophiopogon japonicus	
full sun	5.0
46% shade	5.0
64% shade	5.0
Raphiolepis indica	
full sun	0.0
46% shade	3.6
64% shade	3.9
Ternstroemia gymnanthera	
full sun	5.0
46% shade	5.0
64% shade	5.0

*Quality: O = dead, 1 = poor, 3 = good, 5 = excellent.

Reference: Keever, G.J., G.S. Cobb, and J.C. Stephenson. 1988. Interior performance of temperate zone plants. *Journal of Environmental Horticulture.* 6(3):84-87.

Use of Yellow Traps in Greenhouses

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During the past few years, there has been a great deal of "noise" concerning the use of **yellow stick traps** to monitor and/or reduce populations of certain insect pests. Apparently this information has generated some confusion about the best way to use these traps in the greenhouse, what the traps will "trap," where to get them (or how to make them), etc. Well, at the risk of adding to the confusion, this is an attempt to summarize the current status of yellow trap use.

1. What will the traps catch? Yellow traps will catch winged aphids, leafminer adults, thrips, whiteflies, fungus gnats, and shore flies (among others, but these are the main pests). Recognition of these pests may take some training and a hand lens for magnification, but it is very important to learn the general outlines and colors of the different pest groups.

2. Why should they be used? The best reason to use yellow traps is to keep track of insect population trends (those mentioned above) in your greenhouse. The traps will not totally replace plant inspection, but they can be valuable additions to a pest scouting program. They will not only provide information on when to apply pesticides; they let you know how the control program is going.

3. How often should traps be checked? In most cases, traps should be looked at weekly. Many growers/managers will collect old traps and make actual counts of insects for future reference. Traps can then be cleaned or replaced (see below). Some system of numbering should be used to keep records of trap locations.

4. Where should traps be placed? Place traps at or just above plant height. This is where most of the "action" is in insect flight activity. We have found that fungus gnats, shore flies, thrips, and leafminers can also be trapped quite well just above the "soil." Be sure to place some traps near side vents, doors, and known susceptible plant varieties. In some California greenhouses, traps placed near top vents caught large numbers of flying western flower thrips adults. However, traps at lower levels also caught them at about the same number.

5. How many traps should be used? There are a number of opinions on this, and much seems to depend upon the pest(s) of most concern. A minimum number is somewhere around 4 to 5/acre, but more are certainly useful (up to 40 to 50/acre).

6. What about trap size? Should traps be placed vertically or horizontally? Within limits, trap size is not that important. It seems that smaller traps are more efficient, perhaps because there is more edge to surface area (i.e., there are greater numbers of insects trapped/sq. in. on smaller traps, compared with larger traps). However, large traps are also effective. They can be square, rectangular, cylindrical, etc.

We hang traps vertically, and this seems to do a good job. This is not the only way to use them, though. In Israel, for example, horizontal traps are used to trap the sweetpotato whitefly, *Bemisia tabaci*, in tomato greenhouses.

7. Is it best to purchase traps or make them "in house"? Another difficult question. The answer depends on how much your time is worth. Traps can be made quite effectively out of almost anything that either is or can be painted bright yellow. Rustoleum comes in bright yellow, and works quite well. The sticky material can be as simple as a thin layer of cooking oil (Dr. Jim Price of the Gulf Coast Research Center, Florida, says this works very well), other oils, a mixture of mineral oil and petroleum jelly, or commercially prepared materials such as Sticky Stuff (Olson Products Inc., P.O. Box 1043, Medina, OH 44256). Some "trappers" have placed the sticky material on clear plastic wrap and covered the yellow surface with the wrap for easier removal and trap changing. This brings us to sources of prepared traps. Traps should be available through most greenhouse supply outlets. If not, they should be able to obtain them for you. Olson Products, mentioned above, also sells traps.

To summarize, the keys to all of this are: (1) Use yellow traps as a pest management tool; (2) learn to identify what you catch; and (3) check, record, and/or change traps weekly. Remember that traps will not replace plant inspection, but are to be used along with it.

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Houseplants Cleanse Air

Initial findings of research indicate that plants may be useful for removing pollutants from indoor air. And NASA thinks the way plants take in and use pollutants could help the space agency develop self-contained living environments for long-term space travel and planet colonies. The study is a joint project of NASA and the Associated Landscape Contractors of America. The initial findings are also good news for us earthlings.

Two pollutants cited in the study are formaldehyde and carbon monoxide, both having been linked to health problems. Formaldehyde gas is given off from materials such as textiles, upholstery and carpeting. Carbon monoxide is produced when coal, oil, natural gas, or tobacco are burned. It is thought that this "news" may help sell more plants in our industry.

Common houseplants considered the best removers of indoor pollutants include Aloe vera, snake plant, golden pothos, heartleaf philodendron, elephant-ear philodendron, Chinese evergreen and spider plant. The studies concentrated on foliage plants which have a good amount of leaf surface to take in gases, break them down and use them. In fact, formaldehyde and carbon monoxide are similar in chemical structure to carbon dioxide, the gas plants "breathe in" for growth and development. The similarity between the gases allows the foliage plants to take them all in at the same time. A final report on the NASA research is expected in 1990.

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No Interiorscape Forum is scheduled for winter quarter. Watch for announcements of a program in the spring.